VOLOSOV, D. S.

"Methods for Designing Complex Photographic Systems", Glavpoligrafizdat, Main Polygraphic Publishing House, 396 pp, 1952.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001860720002-5"

VOLOSOV, D.S.

VOLOSOV, D.S.; PECHATNIKOVA, Sh.Ya.

"Bifokator" for wide-angle anamorphite optical systems for wide-screen cinematography. Zhur.nauch.i prikl.fot.i kin. 2 no.2:116-129 Mr-Ap '57. (MLRA 10:5)

1.Gosudarstvennyy opticheskiy institut im. S.I. Vavilova.
(Motion-picture cameras)

VOLOSOV, D.S.

The present status of photographic and cinematographic optics in the Soviet Union and the immediate prospects for its development. Zhur. nauch. i prikl. fot. i kin. 3 no.1:55-65 Ja-F '58.
(MIRA 11:2)

(Photographic optics)
(Cinematography)

51-4-5-16/29

AUTHOR: Volosov, D.S.

TITLE: Principles of a Theory of Thermo-Optical Aberrations (Osnovy teorii termoopticheskikh aberratsiy). I. Thermo-Optical Aberrations of the Image Position (I. Termoopticheskiye aberratsii polozheniya izobrazheniya)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 5, pp 663-669 (USSR)

ABSTRACT: Changes of temperature cause changes in the optical constants of glasses and of geometrical parameters of the optical and mechanical parts in optical apparatus. Low thermal conductivity of optical materials may produce temperature gradients in lenses. Temperature fluctuations upset the state of correction for the aberrations of the system and lead to de-focussing of the image plane and to a change in the image size. The present paper deals with the problem of correction for temperature fluctuations. Calculations of an optical system which is compensated for changes of temperature are simplified if it is assumed that these temperature changes proceed very slowly; in this case temperature gradients are negligibly small and can be neglected. If such an

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51-4-5-16/29

Principles of a Theory of Thermo-Optical Aberrations. I. Thermo-Optical Aberrations of the Image Position

assumption is made the problem reduces to compensation for the displacement of the image plane (thermo-optical aberrations of the image position) and for fluctuations in the image size (thermo-optical aberration of magnification). The first of those aberrations is important in long-focus objectives; the second is important in the optical apparatus used for aerial topography and in certain precise astronomical, geodetic and other measurements connected with determination of co-ordinates of certain objects. The author assumes that the optical system is thermally insulated and this of course slows down temperature changes. The author gives a theory of the thermo-optical aberration of the image position for optical systems consisting of components of finite thickness and for systems of infinitely thin components. The paper is entirely theoretical. There are 2 references, 1 of which is English and 1 American.

Card 2/2

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S.I. Vavilova (State Optical Institute imeni S.I. Vavilov)

SUBMITTED: June 28, 1957

1. Optical instruments - Thermal effects - Theory

SOV/51-4-6-10/24

AUTHOR: Volosov, ~~D.S.~~

TITLE: Principles of the Theory of Thermo-Optical Aberrations. (Osnovy teorii termoopticheskikh aberratsiy) II. Thermo-Optical Aberration of Magnification. (II. Termoopticheskaya aberratsiya uvelicheniya)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 6, pp 772-778 (USSR)

ABSTRACT: In precision photography one must consider thermo-optical aberrations, such as changes in the linear dimensions of the image in certain planes, e.g. on the surface of the photographic plate, which are caused by changes of temperature. Such an aberration is called the thermo-optical aberration of magnification or the second thermo-optical aberration. The author obtains an expression for the coefficient of the second thermo-optical aberration in a form convenient for optical calculations. The second thermo-optical aberration theory is applied to a system consisting of thin lenses. The author also deals with conditions for retention of the optical adjustment in a system in

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SOV/51-4-6-10/24

Principles of the Theory of Thermo-Optical Aberrations. II. Thermo-Optical Aberration of Magnification

spite of changes of temperature. This entirely theoretical paper is the continuation of earlier work (Part I is given as Ref 4). There are 4 Soviet references.

ASSOCIATION: Gosudarstvennyy Opticheskiy Institut im. S.I. Vavilova (State Optical Institute imeni S.I. Vavilov)

SUBMITTED: June 28, 1957

Card 2/2

AUTHOR: Volosov, D.S. SOV/51-5-2-15/26

TITLE: Principles of the Theory of Thermo-Optical Aberrations (Osnovy teorii termoopticheskikh aberratsiy). III. Thermo-Optical Aberrations of Systems Consisting of Thin Components (III. Termoopticheskiye aberratsii sistem, sostoyashchikh iz tonkikh komponentov)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 2, pp 191-199 (USSR)

ABSTRACT: Using the results obtained earlier (Ref 1) the author discusses a general method of calculation of thermo-optical aberrations and corrections for them for optical systems consisting of thin components. Each of such components may itself be a system of several thin lenses. The author finds the coefficients of thermo-optical aberrations of position and magnification for a system of p thin lenses. Then he expresses the thermo-optical aberration coefficients of such a system in terms of thermo-optical parameters of its components. He deals with the thermo-optical parameters of a simple lens and of a system

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SOV/51-5-2-15/26

Principles of the Theory of Thermo-Optical Aberrations. III Thermo-Optical Aberrations of Systems Consisting of Thin Components

consisting of two separate lenses or two lenses in optical contact. A nomogram for calculation of two-lens objectives corrected for thermo-optical aberrations is given in an attached chart (Fig 1). The reverse of this chart gives the thermo-optical constants of various optical glasses in the form of a grid (Fig 2). There are 3 figures and 1 Soviet reference.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S.I. Vavilova (State Optical Institute imeni S.I. Vavilov)

SUBMITTED: September 28, 1957

Card 2/2

1. Optical systems--Performance 2. Optical systems--Design 3. Optical systems--Materials 4. Lenses--Effectiveness

VOLOSOV, David Samuilovich; TSIVKIN, Mikhail Vul'fovich, dotsent; PANFILOV, N.D., red.; MALEK, Z.N., tekhn.red.

[Theory and design of optical systems for projection equipment] Teoriia i raschet svetoopticheskikh sistem proektsionnykh priborov. Moskva, Gos.izd-vo "Iskusstvo," 1960. 525 p. (MIRA 13:12)

1. Rukovoditel' laboratorii Gosudarstvennogo opticheskogo instituta im. S.I.Vavilova i kafedry fiziki i optiki Leningradskogo instituta kinoinzhenerov (for Volosov).
(Optics) (Projectors)

L 9702-66

ACC NR: AP5026539 SOURCE CODE: UR/0286/65/000/019/0083/0084

AUTHORS: Volosov, D. S.; Khmel'nikova, N. P.

ORG: none

TITLE: Illuminating a wide-angle objective with large back focal length. Class 42, No. 175268 [announced by Organization of the State Committee for Defense Technology SSSR (Organizatsiya gosudarstvennogo komiteta po oboronnoy tekhnike SSSR)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 19, 1965, 83-84

TOPIC TAGS: optic lens, optic instrument

ABSTRACT: This Author Certificate describes an illuminating wide-angle objective with large rear focal length. The objective contains eight lenses, three of which form the first component and the others the second component. To increase the rear focal length and to correct distortion in the objective, the first and third lens of the first component have negative optical powers, and the second lens (situated between the former two lenses) has a positive optical power (see Fig. 1). To correct for astigmatism and surface curvature of the image for small size objectives, the sum of optical powers of the first two lenses (of the first component) is approximately zero, and the absolute focal distance of the third lens of this component is 1.5--2

Card 1/2 UDC: 535.813 1:535.317.2

L 9702-66

ACC NR: AP5026539

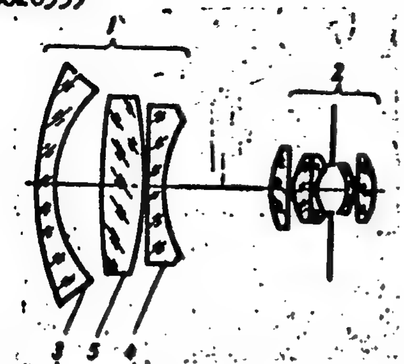

Fig. 1. 1 - First component; 2 - second component; 3 - first lens of first component; 4 - third lens of first component; 5 - second lens of first component.

times the focal length of the whole objective. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 15Jun64

Card 2/2

(A) (N) L 11164-66 EWT(1)/T IJP(c)

ACC NR: AP6000363 SOURCE CODE: UR/0286/65/000/021/0057/0057

AUTHORS: Volosov, D. S.; Stefanskiy, M. S.; Isayeva, I. Ye.; Gradoboyeva, N. A. 36 B

ORG: none

TITLE: Objective with variable focal length. Class 42, No. 176094

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 21, 1965, 57

TOPIC TAGS: optic lens, photographic equipment

ABSTRACT: This Author Certificate presents an objective with variable focal length, consisting of a variable magnification adapter. The adapter includes four components, two of which are mounted for synchronous motion along the optical axis. One of the components is fixed for the whole range of focal length variation and serves for focusing the objective at a finite distance. To maintain the constancy of the position of the image plane while simplifying the mechanical design of the objective mounting, the adapter components are made with lens powers of alternating signs (see Fig. 1). The second and third components are mounted for synchronous motion in mutually opposite directions along the optical axis of the objective. The motion of the fourth component of the adapter has a nonlinear dependence on the motion of the second and third components.

UDC: 535.813:535.317.226:771.351.76

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L 11164-66

ACC NR: AP6000363

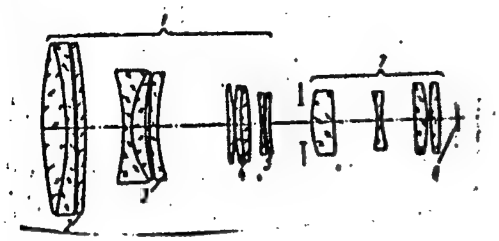


Fig. 1. 1 - Adapter; 2, 3, 4, and 5 - components of adapter; 6 - image plane; 7 - objective.

Orig. art. has: 1 diagram.

SUB CODE: 14/ SUBM DATE: 07Sep64

OC

Card 2/2

ACC NR: AP6021462 SOURCE CODE: UR/0413/66/000/011/0083/0083

INVENTOR: Volosov, D. S.; Fakhretdinova, R. G.

ORG: None

TITLE: A photographic objective lens. Class 42, No. 182360

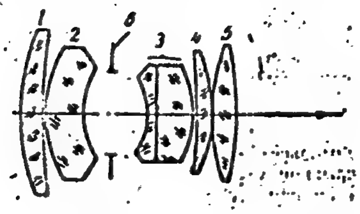
SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 11, 1966, 83

TOPIC TAGS: photographic lens, refractive index, light aberration

ABSTRACT: This Author's Certificate introduces: 1. A photographic objective lens containing five components, the first and fifth being isolated lenses. The second and third components are located on either side of the iris diaphragm and have their refracting surfaces open to the air with the concave surfaces directed toward the diaphragm. Aberration correction of broad inclined beams is improved by cementing two lenses together to make the third component while the second and fourth components are isolated lenses. The index of refraction of the glass for the lenses in the compound component is greater than 1.65. 2. A modification of this lens in which the back focal length is increased by making the thickness of the meniscus which is used as the second component less than 20% of the focal distance of the objective. The last component of the objective is made from glass with an index of refraction of less than 1.52.

Card 1/2 UDC: 771.351.7

ACC NR: AP6021462



1-5--components of the objective; 6--iris diaphragm

SUB CODE: 17/ SUBM DATE: 22Mar65

Card 2/2

ACC NR: AP7005650 SOURCE CODE: UR/0413/67/000/002/0099/0099

INVENTOR: Volosov, D. S.; Lebedeva, N. A.

ORG: None

TITLE: A compound objective lens. Class 42, No. 190610

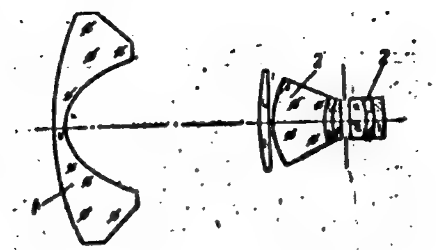
SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1967, 99

TOPIC TAGS: optic lens, wide angle lens, camera component

ABSTRACT: This Author's Certificate introduces: 1. A compound objective lens made up of eight elements, the first being a negative lens with the concave surface turned toward the image. The unit is designed for increased speed and wide-angle viewing as well as reduced overall dimensions. The concave surface of the first lens is described by an equation of degree greater than two. The last two components of the lens are made from three components cemented together, the thickness ratio of the third and fourth components being greater than 2.0. The effective aperture of the first refracting surface is at least as great as the distance between the apex of this surface and the second (positive) lens. 2. A modification of this lens corrected for astigmatism and coma. The thickness of the last three-component element is less than the absolute value of the radius of curvature of the last surface of the objective by a factor of 1.5-2.0.

Card 1/2 UDC: 535.824.28

ACC NR: AP7005650



1—concave surface of the first lens; 2—three-component elements

SUB CODE: 14, 20 SUBM DATE: 11Dec65

Card 2/2

VOLOSOV, G.

New cold storage stands. Sov.torg. 33 no.5:40-43 My '60. (MIRA 13:11)
(Cold storage lockers) (Store fixtures)

VOLOSOV, G.

Universal machine. Obshchestv.pit. no.10:44-47 O '58. (MIRA 11:11)
(Kitchen utensils)

VOLOSOV, G.

Refrigerating machinery for self-service stores. Nov.torg. tekh. no.3:8-10 '56. (MLRA 9:10)

(Refrigeration and refrigerating machinery)

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001860720002-5"

AKULOV, L.; VOLOSOV, G.

Development of the machinery industry manufacturing equipment for trade. Sov. torg. 35 no.10:16-17 O '61. (MIRA 14:12)
(Machinery industry)

AKULOV, L.S.; ACHIL'DIYEV, U.I.; VOLOSOV, G.D.; GORDON, L.I.; GRIN, G.V.; GROMOV, M.A.; KIRILLOV, A.Ya.; LIFSHITS, N.I.; MITROPOL'SKIY, A.V.; RAYSKIY, I.D.; SMIRNOV, V.B.; FAYVUSOVICH, A.Kh.; FEDOROVA, I.Yu.; TSYPIN, I.M.; CHEKHOVICH, D.I.; ISHKOVA, A.K., red.; SUDAK, D.M., tekhn.red.

[Handbook on equipment for commercial enterprises and public food service] Spravochnik po oborudovaniiu dlia predpriiatii torgovli i obshchestvennogo pitaniia. Moskva, Gos.izd-vo torg.lit-ry, 1959. 322 p. (MIRA 12:12)

1. Inzhenerno-tekhnicheskiye rabotniki Upravleniya torgovogo oborudovaniya i TSentral'nogo konstruktorskogo byuro torgovogo mashinostroyeniya (for all except Ishkova, Sudak).
(Business enterprises--Equipment and supplies)
(Restaurants, lunchrooms, etc.--Equipment and supplies)

AKULOV, L.S.; ACHIL'DIYEV, U.I.; VOLOSOV, G.D.; GORDON, L.I.; GRIN, G.V.; GROMOV, M.A.; KIRILLOV, A.Ya.; LIFSHITS, N.I.; MITROPOL'SKIY, A.V.; RAYSKIY, I.D.; SMIRNOV, V.B.; FAYVUSOVICH, A.Kh.; FEDOROVA, L.Yu.; TSYPIN, I.M.; CHEKHOVICH, D.I.; ISHKOVA, A.I., red.; KISELEVA, A.A., tekh.red.

[Handbook on equipment for commercial enterprises and public food service] Spravochnik po oborudovaniiu dlia predpriiatii torgovli i obshchestvennogo pitaniia. Izd.2., dop. Moskva, Gos. izd-vo torg. lit-ry, 1960. 333 p. (MIRA 14:10)

(Restaurants, lunchrooms, etc.--Equipment and supplies)

AKULOV, Leonid Sergeyevich; VOLODIN, Georgiy Davydovich;
KUL'CHITSKIY, Vadim Stepanovich

[Commercial technical equipment; a handbook] Torgovo-tekhnologicheskoe oborudovanie; spravochnik. Moskva, Ekonomika, 1964. 279 p. (MIRA 18:1)

MOISEYEV, N. N.; VOLOSOV, M. D.

"Contribution a l'analyse asymptotique de systemes nonlineaire."

report submitted for Intl Symp on Forced Vibrations in Nonlinear Systems, Marseille, 7-12 Sep 64.

Volosov, M.P.

PHASE I BOOK EXPLOITATION SOV/4266

Progressivnaya tekhnologiya i vysokoproizvoditel'nyy instrument; opyt KhTGZ imeni Kirova (Advanced Processing and Highly-Productive Tools; Experience of the Khar'kov Turbogenerator Plant imeni Kirov) Moscow, Mashgiz, 1960. 155 p. 5,500 copies printed.

Reviewer: P. Ye. Dudnik Engineer; Ed.: M. S. Soroka; Chief Ed. (Southern Division, Mashgiz): V. K. Serdyuk, Engineer.

PURPOSE: This booklet is intended for technical personnel and innovators.

COVERAGE: The booklet discusses the experience of innovators and technical personnel in introducing advanced processes and machine tools at the KhTGZ imeni Kirov (Khar'kov Turbogenerator Plant) for the manufacture of steam turbine rotors, for tapping coarse threads, processing steam turbine blades. Experience in introducing artificial cooling for interference fits, and in mastering the manufacture of welded steam-turbine rotors is described. The

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Advanced Processing (Cont.) SOV/4266

booklet covers the advances in technology developed and introduced at the factory in the last few years. No personalities are mentioned. No references are given.

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Advanced Processing (Cont.) SOV/4266

AVAILABLE: Library of Congress

VK/rn/ec
11-14-60

Card 3/3

VOLOSOV, N.S.

Automated line for the preparation of lime concrete mixes. Stroi. mat. 11 no.6:11-13 Je '65. (MIRA 18:7)

1. Rukovoditel' laboratorii Vsesoyuznogo nauchno-issledovatel'skogo instituta po mashinam dlya promyshlennosti stroitel'nykh materialov.

VOLOSOV, N.S., inzh.; DORONCHEV, N.S., inzh.

Modernizing the equipment of plants producing reinforced concrete products and large wall blocks. Stroi. i dor. mashinostr. no.4:18-20 Ap '58. (MIRA 11:4)

(Reinforced concrete construction)

VoLosov, N S

KRIVITSKIY, Mikhail Yakovlevich, kand.tekhn.nauk; VOLOSOV, Naum Semenovich, inzh.; NEKRASOV, K.D., doktor tekhn.nauk, nauchnyy red.; KRUGLOV, S.A., red.; GILENSON, P.G., tekhn.red.

[Plant manufacture of elements from foam cement and foam silicate] Zavodskoe izgotovlenie izdelii iz penobetona i penosilikata. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1958. 158 p. (MIRA 11:5)

(Precast concrete)

VOLOSOV, M.S., inzhener (g. Leningrad)

Making lime-sand blocks and panels for housing construction. Stroi.pred.neft.prom. 2 no.5:18-21 My '57. (MIRA 10:7)
(Building materials)

VOLOSOV, N.S., inzhener; MAYOROV, B.A., inzhener; ROZHAVSKIY, I.M., inzhener.

Automatic control of the process of the heat and steam treatment in autoclaves. Stroi.pred.neft.prom. 1 no.8: 8-10 O '56. (MLRA 9:12)

(Lightweight concrete) (Automatic control)

VOLOSOV, N.S.; KUBA, Yu.B.

Standard plant for producing products made of cellular concretes with capacity of 30,000 cubic meters per year. Stroi.i dor.mashinostr. no.11:18-21 N '56. (MLRA 9:12)
(Concrete plants) (Lightweight concrete)

S/143/60/000/012/004/007
A163/A026

AUTHOR: Volosov, S. M., Candidate of Technical Sciences, Docent

TITLE: New substantiation of the second law thermodynamics

PERIODICAL: Energetika, no. 12, 1960, 69 -73

TEXT: The article deals with a new substantiation of the second law of thermodynamics. The author presents equantions which not only solve the problem regarding the existence of entropy as a magnitude (sufficient for the quasi-static heat exchange), but generally prove the existence of magnitudes adequate for the respective reactions. Considering the necessity of finding, with the help of thermodynamical methods, substantiations in which the existence of entropy is not bound to the limited true state of its growth, the author brings forth generally adopted determinations and conditions which appear to be adequate to obtain the formula

$$\delta Q = T\,dS \qquad (1)$$

The substantiation recommended does not contain hypotheses which would

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New substantiation of the second law thermodynamics A163/A026

specially prove some specificity of thermal phenomena. By the state of a system is understood the total of all properties of this system. The state parameters are those magnitudes the values of which characterize the state of a system. A change in the state of a system (process) is unfailingly followed by a change of the state parameters. For each system, there exist some definite relations between the state parameters. Therefore, some parameters are the functions of some other parameters. When studying the processes, it is necessary to clarify how many parameters and which of them, in each given case, may be considered independent. A change in the state of the system is attained by outside reactions, i.e., by reactions of the environment. The extent of the environment reaction on the system is determined by the performance of the given type of reaction, i.e., the mechanical, electrical, magnetic, thermal one, etc. It is important to find the formula permitting one to rate the single performances δQ_i. According to the law of conservation and energy transformation, the total of all elementary performances on the system, brought about by the environment, is equal to the infinite small change of the energy E of the system

$$\sum_{e}^{n} \delta Q_i = dE \tag{2}$$

The energy of the system appears to be the function of the state and may be considered the function of the independent parameters of the state x_j (their number should be regarded as equal to m). Therefore,

$$E = E\,(x_1, x_2, \ldots, x_m) \tag{3}$$

$$dE = \sum_{1}^{m} \frac{dE}{dx_j}\,dx_j \tag{4}$$

$$\sum_{1}^{n} \delta Q_i = \sum_{1}^{m} \frac{dE}{dx_j}\,dx_j \tag{5}$$

The latter makes it possible to regard each performance of δQ_i of any reaction as the total of Pfaff's formula

$$Q_i = M_{1i}dx_1 + M_{2i}dx_2 + \dots + M_{mi}dx_m \ (i = 1, 2, 3, \dots, n) \qquad (6),$$

where each of the coefficients M_{ji} appears to be the function of the independent parameters of state

$$M_{ji} = M_{ji}\,(x_1, x_2, \dots, x_m). \qquad (7).$$

As a result, the interactions of the environment with the system under study may be characterized by the following total of equations:

$$\left.\begin{array}{l} \delta Q_1 = M_{11}\,dx_1 + M_{12}\,dx_2 + \dots + M_{1m}\,dx_m, \\ \delta Q_2 = M_{21}\,dx_1 + M_{22}\,dx_2 + \dots + M_{2m}\,dx_m, \\ \dots\dots\dots\dots\dots\dots\dots\dots \\ \delta Q_n = M_{n1}\,dx_1 + M_{n2}\,dx_2 + \dots + M_{nm}\,dx_m. \end{array}\right\} \qquad (8).$$

A quasi-static change of the state of the system, and consequently a change of the state parameters, may be caused only by the effect of the environment on the system. Therefore, the system, being in a balanced state, cannot arbitrarily change its state without reaction by the environment. Hereby, all parameters which determine the state of the system, have to remain unchanged. The implementation of the above leads to a rather important result. The sum of formulae of Equation 8 should yield only trivial solutions when meeting the conditions of

$$\delta Q_1 = \delta Q_2 = \dots = \delta Q_n = 0 \qquad (9a)$$

and

$$dx_1 = dx_2 = \dots = dx_m = 0 \qquad (9b)$$

for the system of homogeneous equations

$$\left.\begin{array}{l} M_{11}\,dx_1 + M_{12}\,dx_2 + \dots + M_{1m}\,dx_m = 0, \\ M_{21}\,dx_1 + M_{22}\,dx_2 + \dots + M_{2m}\,dx_m = 0, \\ \dots\dots\dots\dots\dots\dots\dots\dots \\ M_{n1}\,dx_1 + M_{n2}\,dx_2 + \dots + M_{nm}\,dx_m = 0, \end{array}\right\} \qquad (10)$$

For this purpose, it is necessary that the number of formulae n equals the number of independent variables m, i.e. $m = n$ (11). In other words the number of independent parameters of the state of the thermodynamical system has to correspond to the number of reactions of the environment on the system. The coefficients M_{ij} should be

$$\begin{vmatrix} M_{11}, & M_{12}, & \dots & M_{1n} \\ M_{21}, & M_{22}, & \dots & M_{2n} \\ \dots & \dots & \dots & \dots \\ M_{n1}, & M_{n2}, & \dots & M_{nn} \end{vmatrix} \neq 0 \qquad (12)$$

In case a system with three reactions is considered, the system is determined by three independent parameters of state, i.e.,

$$\left.\begin{aligned} \delta Q_1 &= M_{11}dx_1 + M_{12}dx_2 + M_{13}dx_3, \\ \delta Q_2 &= M_{21}dx_1 + M_{22}dx_2 + M_{23}dx_3, \\ \delta Q_3 &= M_{31}dx_1 + M_{32}dx_2 + M_{33}dx_3 \end{aligned}\right\} \qquad (13)$$

The holomonicity of each δQ_i in the system of Equation (13) is proved by the fact that this system, meeting the conditions of Equations (9a) and (9b), must yield only trivial solutions at $\delta Q_1 = \delta Q_2 = \delta Q_3 = 0$, and therefore the determinant Δ, composed of the coefficients in Equation (13),

$$\Delta = \begin{vmatrix} M_{11} & M_{12} & M_{13} \\ M_{21} & M_{22} & M_{23} \\ M_{31} & M_{32} & M_{33} \end{vmatrix} \tag{14}$$

should not be equal to zero. As is known, the determinant may be converted to a diagonal by means of linear conversions. It will assume the form

$$\Delta = \begin{vmatrix} N_{11} & & 0 \\ & N_{22} & \\ 0 & & N_{33} \end{vmatrix} \tag{15}$$

Such a conversion does not change the properties of the system which represents in itself a selection of new coordinates. This means that the system of Equation (13) may be converted to the system

$$\left.\begin{array}{llll} \delta Q_1 = & N_{11}dy_1 & & \\ \delta Q_2 = & & N_{22}dy_2 & \\ \delta Q_3 = & & & N_{33}dy_3 \end{array}\right\} \qquad (16)$$

the coordinates are well chosen. All this permits one to maintain that the expression for any performance of the reaction (also for the heat exchange) has an integrating multiplier $\delta Q = \mu dF$, where

$$\mu = \mu\,(x_1,\ x_2,\ x_3) \text{ and } F = F\,(x_1,\ x_2,\ x_3).$$

Assuming that the system is thermally homogeneous, it is possible to obtain (by known methods) $\delta Q = TdS$ for the thermal reaction. The author concludes

S/143/60/000/012/004/007
A163/A026

New substantiation of the second ....

by pointing out that the designation "second law" should be applied only to the growth of entropy of an isolated system in non-static processes. There are 12 references: 8 Soviet-bloc, 4 non-Soviet-bloc. The English language publication reads as follows: Ruark A. The Proof the Corollara of Carnots Theorem. Phil. Mag., 49, 1925.

SUBMITTED: January 29, 1960

Card 9/9

VOLOSOV, S.M.

Comments on IA.Z. Kazavchinskii's article "Using classical concepts in a new system of justification of the second law of thermodynamics." Inzh.- fiz. zhur. 7 no.12:123-124 D '64
(MIRA 18:2)

1. Vyssheye voyenno-morskoye inzhenernoye uchilishche, Leningrad.

1. VOLOSOV, S. S.

2. USSR (600)

4. Measuring Instruments

7. Methods for automatic control of machine part dimensions in grinding. Stan.i instr. 23 no. 11, 1952.

9. Monthly Lists of Russian Accessions, Library of Congress, March 1953, Unclassified.

VOLOSOV, S. S.

Dissertation: "Active-Dimensional Control of Parts in Grinding." Cand Tech Sci, Moscow Machine Tool and Tool Inst imeni I. V. Stalin, 21 Apr 54. (Vechernyaya Moskva, Moscow, 12 Apr 54)

SO: SUM 243, 19 Oct 1954

VOLOSOV, S.S., kandidat tekhnicheskikh nauk, dotsent.

Use of automatic tool adjusters in precision machining. Vest.mash. 35 no.9:32-33 S '55. (MLRA 9:1)
(Machine-shop practice)

VOLOSOV, S.S.

AID P - 4496

Subject : USSR/Engineering

Card 1/1 Pub. 128 - 23/29

Author : Volosov, S. S., Kand. Tech. Sci., Dotsent

Title : Active control in grinding

Periodical : Vest. mash., #4, p. 79-82, Ap 1956

Abstract : "Active" control is understood as applied not to the finished product (which is "passive" control) but during its production. This article describes the method of active control and equipment used as applied to the process of fine grinding, namely: 1) control of parts of cylindrical form, 2) control of flat grinding on lathes with rectangular tables, and 3) control of inner grinding. Diagrams.

Institution : None

Submitted : No date

VOLOSOV, S.S.

28(1) PHASE I BOOK EXPLOITATION SOV/1153

Volosov, Sergey Sergeyevich, Candidate of Technical Sciences, Docent

Avtomaticheskoye obespecheniye tochnosti razmerov pri shlifovanii (Automatic Accuracy Control in Grinding) Moscow, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958, 117 pp.

Reviewer: Draudin-Krylenko, A.T., Engineer; Ed.: Volodin, Ye. I., Engineer; Tech. Ed.: El'kind, V.D. and Uvarova, A.F.; Managing Ed. for Literataure on Metal Working and Machine Building (Mashgiz): Beyzel'man, R.D., Engineer.

PURPOSE: This book is intended for engineers in machine-building plants and in engineering offices.

COVERAGE: The book deals with problems of feedback control— the most advanced method in the development of modern measuring technique. The basic problems of automatic dimension control of ground parts are discussed. Various methods for achieving this control are given, the basic devices used in feedback control

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are described, and the characteristics of the components of servomechanisms for machine tools are presentea. The problems of setting feedback measuring devices for the given dimensions are examined. No personalities are mentioned. There are 14 Soviet references.

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Automatic Accuracy Control in Grinding 1153

AVAILABLE: Library of Congress

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2-24-59

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VOLOSOV, S.S.; KANEVTSEV, V.M., kand. tekhn. nauk, retsenzent

[Technological and metrological fundamentals for precision in regulating dimensions in the manufacture of machinery] Tekhnologicheskie i metrologicheskie osnovy tochnosti regulirovaniia razmerov v mashinostroenii. Moskva, Izd-vo "Mashinostroenie," 1964. 278 p. (MIRA 17:6)

VOLOSOV, S.S., dotsent, kand.tekhn.nauk

Checking run-outs and clearances in antifriction bearings. Vzaim.i tekh.izm v mashinostr.; mezhvuz.sbor. no.2:322-338 '60. (MIRA 13:8)

(Bearings (Machinery)--Testing)

S/115/60/000/05/04/034
B007/B011

AUTHORS: Volosov, S.S., Turbin, G. B.

TITLE: Automatic Warranty of the Measuring Acouracy 14 in Centerless Grinding

PERIODICAL: Izmeritel'naya tekhnika, 1960, No. 5, pp. 7-9

TEXT: Problems related with the development of an adjustment device for a centerless grinder (for grinding conical rollers of roller bearings) are investigated here. Unless there was an adjustment device compensating the influence of occasional machining errors, the spread of the actual occasional machining errors was determined before constructing the apparatus. An examination was first made of the accuracy of the process of centerless grinding of conical rollers. The diagrams obtained, which are given in Fig. 1, show that without considering gross machining errors, the use of adjustment devices in centerless grinding of conical rollers is well possible. The diagrams also show that modifications in roller diameters occur so slowly that one does not have to control all of the rollers coming from the machine. On the other hand, one curve shows that /c

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Automatic Warranty of the Measuring Accuracy in Centerless Grinding

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B007/B011

gross machining errors occur in centerless grinding of conical rollers. For this reason, it is more expedient to effect an adjustment according to the central line, and so it was done in the present case. The scheme of the adjustment device is shown in Fig. 2 and described. Adjustment is done by the successive control of parts. The measuring system itself is based on the construction of the measuring position in the automatic sorting machine for conical rollers. The measurement is done with the aid of a hard-alloy ring. The rollers are introduced into this ring by means of a pusher. The position of the pusher is a function of the dimension of the roller to be controlled. The pusher is connected with a feeler. The contact of this feeler is open or closed depending on the roller diameter. The electric circuit secures the adjustment according to the central line and consists of three twin triodes. The mode of operation of the system is briefly described. There are 2 figures and 1 Soviet reference.

Card 2/2

S/121/60/000/006/003/008

AUTHOR: Volosov, S. S.

TITLE: The Accuracy of Re-Setting Systems

PERIODICAL: Stanki i Instrument, 1960, No. 6, pp. 11-13

TEXT: The author investigates the accuracy of re-setting systems by analyzing various methods of re-setting: a) determining the parameter B (which is the sector in whose limits the grouping center of random errors is located) when re-setting by one machine part; b) re-setting by low pulses; c) re-setting by the average sampling dimension and by the median; d) re-setting by the position of the cutting tool edge. He compares the efficiency of the various methods and points out that a distinctive peculiarity of any re-setting system consists in the fact that it makes it possible to compensate only functional errors of machining and does not eliminate the effects of its own random errors. There are 4 diagrams, and 2 Soviet references.

Card 1/1

VOLOSOV, S.S., kand.tekhn.nauk, dotsent

Precision of readjusting systems. Vzaim.i tekh. izm.v mashinostr.; mezhvuz.sbor. no.3:294-302 '61. (MIRA 14:8)
(Electronic instruments)

VOLOSOV, S.S.; BOGUSLAVSKIY, L.A.

Automatic readjustment device for conic rollers. Izm. tekh. no.9:8-9 S '64. (MIRA 18:3)

BOGUSLAVSKIY, L.A.; VOLOSOV, S.S.

Errors in the median method of control and readjustment in centerless grinding of conic rollers. Izm. tekh. no.10: 13-16 O '63. (MIRA 16:12)

BOGUSLAVSKIY, L.A.; VOLOSOV, S.S.

Increasing the sensitivity of the feed mechanism of a grinding machine by means of vibrations. Stan. i instr. 34 no.6:14-16 Je '63. (MIRA 16:7)

(Feed mechanisms) (Grinding machines)

IVANOV, A.G.; BURDUN, G.D., doktor tekhn. nauk, prof.; MOLOSOV, S.S.; KOROTKOV, V.P.; FED', Ye.I.; ROSTOVYKH, A.Y.; RYMAR', N.F.; TAYTS, B.A., doktor tekhn. nauk, prof.; KOCHENOV, M.I., kand. tekhn. nauk, retsenzent

[Measuring instruments used in the manufacture of machinery] Izmeritel'nye pribory v mashinostroenii. Moskva, Mashinostroenie, 1964. 523 p. (MIRA 18:1)

VOLOSOV, V.

From the international agricultural fair in Italy. Sov. torg. no.7:30-35 Jl '56. (MLRA 9:10)

1. Chlen pravleniya TSentrosoyuza.
(Verona--Agricultural exhibitions)
(Food industry--Equipment and supplies)

S/120/63/000/001/026/072
E192/E382

AUTHORS: Volosov, V.D., Muratov, V.R. and Nilov, Ye.V.

TITLE: Resolving power of electron-optical convertors

PERIODICAL: Pribory i tekhnika eksperimenta, no. 1, 1963, 113 - 116

TEXT: The picture quality of electron-optical convertors (which find application in the observation of various electrical processes, accompanied by radiation or absorption of light) is characterized by contrast transfer coefficients of the test pictures with periodically changing brightness. The range of values of these coefficients for the test objects of various frequencies is known as the "frequency-contrast characteristic" of the device. The possibility of using this characteristic for describing the quality of electron-optical converters and estimating their resolving power is investigated. The experimental system for measuring the frequency-contrast characteristic of a converter is shown in Fig. 1. The image of the test picture 4 is projected by the objective 14 onto the photocathode of the converter 15, which is to be investigated. Either a micro-objective of 8X

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magnification or a photo-objective, type "Tessar", of f = 7.5 cm is used. An arbitrary square of the test picture can be projected. The picture 4 is illuminated by a filamentary lamp 1, whose filament is projected onto the objective 14 by the condenser 3. The image contrast is reduced by illuminating the surface of the photocathode by the lamp 10. The condenser 8 serves the same purpose as the condenser 3; beams of light from lamps 1 and 10 can be combined by means of the flat glass plate 6. Attenuation of the beams is achieved by introducing neutral filters 2 and 9 of different densities. The chromatic aberration of the objective 14 is compensated by interference and color filters 13 and 11. The diaphragms 5, 7, 12 and 16 are used to reduce the amount of scattered light. The image 15 received on the screen of the converter is transmitted by the micro-objective 17 onto the film 18. The experiments showed that the optical devices of the system, in particular the objective 14, did not reduce the contrast of the image of the test picture in the plane of the photocathode. Several types of electron-optical converters were measured. It was found that the contrast transfer

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Resolving power ....

coefficient of the convertors did not depend on the contrast of the test picture. The contrast of the image on the screen of the convertor was almost independent of the illumination of the photocathode; reduction of the illumination by three times resulted in an increase in the contrast by only 10%. In the case of visual observation or photographic recording of the image of the convertor, the resolution limit for 100% contrast of the test picture was obtained when the image contrast was reduced by 10%. The magnitude of the limit contrast was proportional to the relative fluctuation of the light flux produced by the screen of the convertor. There are 3 figures.

ASSOCIATION: Gosudarstvennyy opticheskiy institut (State Optical Institute)

SUBMITTED: March 6, 1962

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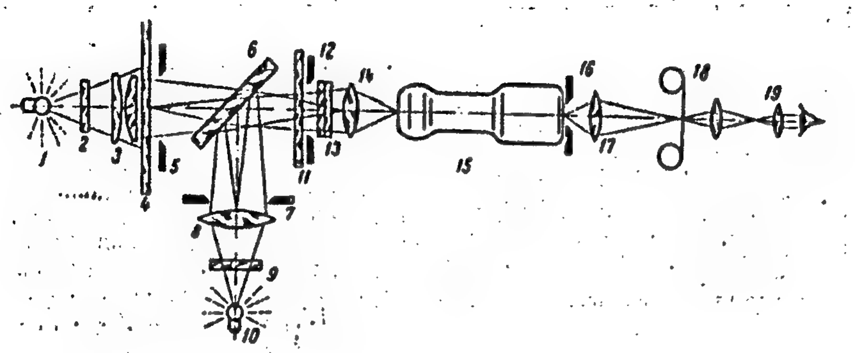
S/120/63/000/001/026/072
E192/E382

Resolving power ....

Fig. 1:



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ACC NR: AP7002417 SOURCE CODE: UR/0051/66/021/006/0715/0719

AUTHOR: Volosov, V. D.; Nilov, Ye. V.

ORG: none

TITLE: The effect of the spatial structure of a laser beam on the second harmonic generation in ADP and KDP crystals

SOURCE: Optika i spektroskopiya, v. 21, no. 6, 1966, 715-719

TOPIC TAGS: nonlinear optics, second harmonic generation, frequency conversion, nonlinear crystal, piezoelectric crystal, ~~ADP crystal, KDP crystal~~, laser beam

ABSTRACT:
The effectiveness of using cylindrical optics in the conversion of laser frequency by means of nonlinear crystals was studied experimentally. The experiments were carried out using the equipment shown in Fig. 1. A Q-switched neodymium glass laser, operating at 1.06 μ, was used to generate 60-nanosec, 17—20-Mw pulses with an ~7' beam divergence. By varying the distance between the crystal (10- and 15-mm thick ADP or KDP) and the lens, the incident specific power could be varied from 20 to 500 Mw/cm^2. The second harmonic generation was recorded by a "rat's-nest"-type wire bolometer with a sensitivity of 0.1 μj per unit scale. The dependence of the conversion factor on the specific laser power incident on variously oriented ADP and KDP

Card 1/3 UDC: 621.375.9 : 535 : 548.0

ACC NR: AP7002417

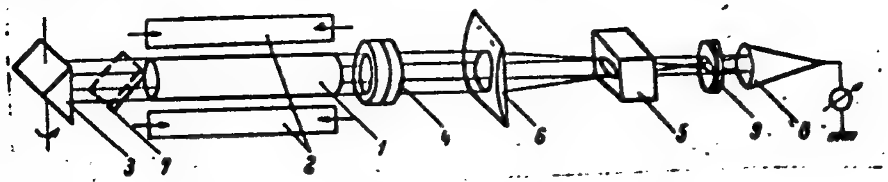

Fig. 1. Schematic of the equipment

1 - Neodymium glass rod; 2 - pumping lamps; 3 - Q-switch prism; 4 - semitransparent mirror; 5 - nonlinear crystal; 6 - cylindrical lens; 7 - plane-parallel plate at Brewster's angle with the optical axis; 8 - colorimeter; 9 - cut-off filter.

crystals was shown graphically. The results indicate that: 1) the use of cylindrical optics yields extremely high laser energy conversion factors at relatively low master oscillation powers; 2) the linear dependence of the conversion factor on the specific power of the fundamental is in agreement with the quadratic dependence of the second harmonic yield on the fundamental power; 3) the highest conversion factor, expressed as a ratio of powers of the second harmonic to the fundamental through the crystal, was approximately 30% for a KDP crystal ($\phi = 45°$). This corresponds to a specific power of

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ACC NR: AP7002417

the order of 140 Mw/cm^2 which, when increased further, led to crazing; 4) ADP crystals exhibit considerably greater resistance to optical loads than KDP crystals. KDP crystals disintegrated under specific loads of the order of 190—200 Mw/cm^2, whereas their ADP counterparts disintegrated at 500 Mw/cm^2. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 01Nov65/ ORIG REF: 001/ OTH REF: 003/ ATD PRESS: 5112

VOLOSOV, V.D.; MURATOV, V.R.; NILOV, Ye.V.

Resolving power of electron optical converters. Prib. i tekh. eksp. 8 no.1:113-116 Ja-F '63. (MIRA 16:5)

1. Gosudarstvennyy opticheskiy institut.
(Electron optics)

VOLOTSKAYA, V.G.

Anisotropy of the galvanomagnetic properties of aluminum in high effective fields. Zhur. eksp. i teor. fiz. 44 no.1: 80-83 Ja '63. (MIRA 16:5)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.
(Aluminum crystals—Magnetic properties)

VOLOSOV, [illegible]. I., Cand Phys-Math Sci -- (diss) "Examination of certain characteristics of electron streams," Novosibirsk, 19[illegible], [illegible], 150 cop. (Joint Scientific Council for Phys-Math and Tech Sci, Siberian Department of AS, USSR)

(KL, 43-60, 116)

S/057/60/030/05/07/014
B012/B056

AUTHORS: Volosov, V. I., Chirikov, B. V.

TITLE: The Theory of the Skin Effect in Transient Operation

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 5, pp. 508 - 511

TEXT: A special case of transient operation, viz. the switching-on of a periodic magnetic field is investigated. In the simplest one-dimensional case for a semi-space ($x > 0$) occupied by a semiconductor, formula (1) holds. This problem is solved by means of the Duhamel integral, and formula (2) is obtained (Ref. 1). This formula is transformed, after which it consists of 2 summands. The first summand is the solution of the skin effect problem in stabilized operation. The second summand has the function $\varphi(\tau)$, which satisfies formula (3), representing the equation of the enforced oscillations of the harmonic oscillator. In the appendix to the present paper $\varphi''(\tau)$ is estimated. For transient operation formula (6) is obtained. In the case of a constant magnetic field being switched-on, transient operation may be expressed by the exact formula (8) (Ref. 4).

The Theory of the Skin Effect in Transient Operation

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B012/B056

By means of formulas (6), (7), and (8) transient operation may be analyzed if an arbitrary periodic magnetic field is switched on. It is pointed out that here the described method is easily applicable to analogous cases in other fields, e.g. to heat conductivity problems. 21
There are 1 figure and 4 Soviet references.

SUBMITTED: November 28, 1957

VC

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37260
S/057/62/032/005/007/022
B125/B102

9.4110

AUTHOR: Volosov, V. I.

TITLE: Floating-drift oscillations in intense electron currents

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 5, 1962, 559-565

TEXT: Floating-drift oscillations in a plane h-f triode with retarding field were considered under slightly simplified conditions. The 3/2 law was assumed to be valid for the distance between cathode and grid. The electrons hitting the collector were assumed to knock out a sufficient number of secondary electrons. Above all, oscillations of frequency $\omega = \pi/t_1$ or $f = 1/2t_1$ are "built up". The conditions for the occurrence of such oscillations read: $V_{mains} > V_{coll}(1+(2\delta)^{2/3})$. A similar case is that of oscillating electrons imparting a considerable part of their energy to the external circuit. A few additional conditions must be satisfied in this case. The period of oscillation of the electron cluster need not depend on the energy of these electrons to allow this cluster to give away much of its energy. The time it takes for the primary

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B125/B102

Floating-drift oscillations ....

electron to travel to the collector must be about equal to the period of oscillation. The monotonic and slight dependence of the oscillation amplitude on the grid voltage, the characteristic dependence of the floating-drift oscillations on the strength of the emission current, and the collector voltage point to significant differences between the present oscillations and those of the Barkhausen-Kurz type (Phys. Zs., 21, 1, 1920). The present oscillations do not depend on the vacuum either. The experimental mechanism under consideration (Fig. 2) is suited to generators in the decimeter and centimeter-wave ranges with fast and slow frequency retuning. The retuning rate is limited by the time of stabilization of the oscillations, which is of the order of some oscillation periods. Such systems are also suited as resonance amplifiers with fast frequency retuning when operating with $\Gamma < 0$ and $|\Gamma| \ll 1$, where $\omega = \omega_0 - i\Gamma$. The frequency and the power of the present system are interrelated by $W = W_0(\omega/\omega_0)^5$. An additional grid near the cathode, to which a negative potential is applied, is able to control the power of oscillations without a change in frequency. N. I. Muratov is thanked for

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B125/B102

Floating-drift oscillations ...

having participated in the experiments. There are 5 figures. The most important English-language reference is: E. M. Boone, M. Uenohara. IRE Trans. ED-5, no. 3, 196, 1958.

SUBMITTED: February 17, 1961

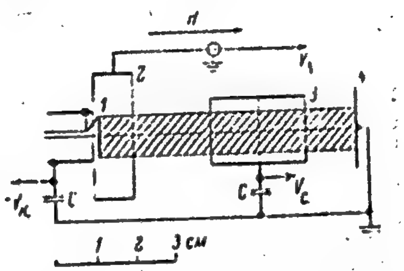

Fig. 2. Schematic representation of experiment. (1) Spiral-shaped W cathode; (2) probe; (3) grid with cylinder; (4) tungsten collector.

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37282

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9.4110

AUTHOR: Volosov, V. I.

TITLE: Maximum steady current strength in a compensated electron flow

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 5, 1962, 566-574

TEXT: The author uses simpler methods than J. Pierce did (J. Appl. Phys., 15, 721, 1944) to show the instability of a plane, one-dimensional electron current under slight perturbations $\overline{\Delta\rho_1} \ll \bar{\rho}_e$ of the mean electron density $\bar{\rho}_e$ in an electron current bounded by two grids. When the potential distribution along the flow and the electron motion are ignored, the perturbation stops growing at $\Delta\bar{v}_e$, as soon as the velocity of a certain part of electrons becomes equal to zero. In the unperturbed solution, V_0 is the beam potential, v_0 the electron velocity, and j_0 the current density. $V(x) = V_0 + V_1(x)$ is valid for the slight perturbation $V_1 \ll V_0$.

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Maximum steady current strength ...

L denotes the distance between the two grids perpendicular to the electron flow. At $\omega_o L/v_o = \pi n$, the incipient perturbation $V_1(x) = c_1 \sin(\pi nx/L)$ in the beam is conserved ("steady perturbation"). If the current strength exceeds a definite critical value, J_{crit}, the first harmonic in the expansion of the sines of $V_1(x,0)$ grows with time. The problem of determining the critical steady current strength, at which the incipient perturbation in the electron flow is conserved, is reduced to finding those conditions, under which steady flows are possible. J_{crit} can be determined by the method of steady perturbations for any geometrical conditions if $V(t)$, $v(t)$, and $\rho(t)$ are constant over a definite cross section of the electron flow. For a plane, band-shaped beam one finds $J_{crit} = (1/\pi)\sqrt{2e/m_e}(V_o^{3/2}/b)F_1(a,b)$, where $F_1(a,b) = (\omega_o/v_o)^2 ab$. F_1 is limited by 1 (for $a \ll b$) and $\pi^2/4$ (for $a = b$). For a cylindrical beam, $J_{crit} = (1/2)\sqrt{2e/m_e}\, V_o^{3/2} F_2$, where $F_2 = (\omega_o/v_o)^2 r_o^2$. In terms of volts and

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B125/B102

Maximum steady current strength ...

amperes, $J_{crit} = 3.31 \cdot 10^{-5} \cdot V_o^{3/2} F$. If $L \gg R$, $F_2 = 2.4$ for $R/r_o = 1$, and $F_2 = 0.968$ for $R/r_o = 6$. If $V_o(x)$ depends on the coordinates (i.e., with partial compensation of the electron current) and if the potential V_o drops parabolically, $j_{crit} \simeq j_{crit}(0)(1-1.10\Delta V_o/V_o)$. Already in first approximation the calculated limit of instability intersects the curve for the state of uncompensated current near the current strength maximum. If the potential oscillates in the compensated current, J_{crit} decreases and is determined by the maximum "sag" of the potential. The compensated current strengths determined experimentally amount to a multiple of J_{max} and differ very little from their theoretical values. For technical reasons, the experimental values of J_{crit} may be 15-25% lower than the actual value. There are 5 figures.

SUBMITTED: February 17, 1961

Card 3/3

L 36408-66 EWT(1)/T IJP(c) AT

ACC NR: AP6022021 SOURCE CODE: UR/0120/66/000/003/0169/0172

AUTHOR: Volosov, V. I.; Pal'chikov, V. Ye.; Tsel'nik, F. A.

ORG: Institute of Nuclear Physics, SO AN SSSR, Novosibirsk (Institut yadernoy fiziki SO AN SSSR)

TITLE: Cathode with pulsed heating of its emitting surface

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 169-172

TOPIC TAGS: electron tube cathode, electron accelerator, electron emission

ABSTRACT: A theoretical and experimental study is reported of an additional pulsed heating of a hot cathode up to near-melting temperature which essentially increases the emission-current density. As both the size of the highest-temperature region and the quantity of evaporating cathode material are small (the duty factor is assumed to be low), a much longer cathode life can be expected. The cathode is preheated to 2000—2500K. A formula for final temperature is derived from an equation describing the ionization loss of the electron energy. An experimental verification included a 2-cm diameter tantalum cathode run at 2300—2400K and additionally pulse-heated up to a current density of 40—70 amp/cm^2; pressure, 10^{-6} torr; pulse duration, 2 μsec. "The authors wish to thank G. I. Budker for discussing the results and K. P. Veselkov for building the laboratory outfit." Orig. art. has: 3 figures, 12 formulas, and 2 tables. [03]

SUB CODE: 20, 09 / SUBM DATE: 26Apr65 / OTH REF: 001/ ATD PRESS: 5039

UDC: 621.385.73

Card 1/1

ABRAMYAN, Ye.A.; BONDARENKO, L.N.; VOLOSOV, V.I.; NAUMOV, A.A.; CHIRIKOV, B.V.

Magnetic screens admitting the passage of circuital electric fields. Prib. i tekh. eksp. 10 no.1:178-181 Ja-F '65. (MIRA 18:7)

L 45454-65 EWT(1) IJP(c)

ACCESSION NR: AP5007053 S/0120/65/000/001/0178/0181

AUTHOR: Abramyan, Ye. A.; Bondarenko, L. N.; Volosov, V. I.; Naumov, A. A.; Chirikov, B. V.

TITLE: Magnetic shields passing an eddy electric field

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1965, 178-181

TOPIC TAGS: magnetic shield

ABSTRACT: Construction and design methods of shields capable of segregating magnetic and electric fields are described. Such a shield consists of one or more open turns of a metal sheet or strip around the magnetic flux being shielded. An eddy electric field passes easily through such a shield while a high air-gap reluctance stands in the way of the magnetic flux. One of the designs (the "labyrinth") was intended for a betatron accelerator and had a shielding factor of 300 at 5 kc. As an exact calculation of emic-field distribution in a labyrinth is

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ACCESSION NR: AP5007053

practically impossible, design formulas are offered whose development is based on more or less crude models. The shielding factor estimated by these formulas at 2.7—15.6 kc is in good agreement with experimental data. "The authors wish to thank G. I. Budker and A. M. Stefanovskiy for their useful discussions, ... V. P. Fedunin for developing the methods and building the labyrinths." Orig. art. has: 5 figures, 12 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 28Dec63 ENCL: 00 SUB CODE: EE, EM

NO REF SOV: 004 OTHER: 002

Card 2/2

VOLOSOV, V.M.

Averaging method. Dokl. AN SSSR 137 no. 1:21-24 Mr-Ap '61. (MIRA 14:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova. Predstavleno akademikom I.G. Petrovskim.
(Averages)

21961

S/020/61/137/005/004/026
C111/C222

16.4100

AUTHOR: Volosov, V.M.

TITLE: Higher approximations in averaging

PERIODICAL: Akademiya nauk SSSR. Doklady, vol.137,no.5,1961, 1022-1025

TEXT: In (Ref.3: DAN, 137,1 (1961)) the author considered the method of averaging for systems

$$\dot{x} = \varepsilon X(x,y,t,\varepsilon), \quad \dot{y} = Y(x,y,t,\varepsilon), \qquad (1)$$

where x and X are n-dimensional vectors, y,Y are m-dimensional vectors, $\varepsilon > 0$, and he constructed the first approximation. In the present paper the author considers the averaged system of second order

$$\dot{\bar{x}} = \varepsilon \bar{X}_1(\bar{x}) + \varepsilon^2 A_2(\bar{x}), \quad \dot{\bar{y}} = Y_0(\bar{x},\bar{y},t) + \varepsilon B_1(\bar{x}) \qquad (4)$$

given in (Ref.3). It is proved that under certain assumptions the solutions of (4) approximate the solutions of (1) with an error $\varepsilon\alpha(\varepsilon)$ in x and an error $\alpha(\varepsilon)$ in y on the interval $t \sim 1/\varepsilon$ ($\alpha(\varepsilon)$ denotes a magnitude for which $\lim_{\varepsilon \to 0} \alpha(\varepsilon) = 0$). As the mean value of the function $F(x,y_0,t_0,y,t)$ the author denotes

$$\bar{F}(x) \equiv \lim_{T \to \infty} \frac{1}{T} \int_{t_0}^{t_0+T} (F|_{y=\varphi(x,x_0,t_0,t)})dt,$$

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21961

S/020/61/137/005/004/026
C111/C222

Higher approximation in averaging

where

$$y = \varphi(x, y_0, t_0, t) \quad (\varphi(x, y_0, t_0, t_0) \equiv y_0) \tag{3}$$

is the general solution being assumed to be known of the degenerated ($\varepsilon = 0$) system

$$\dot{y} = Y_0(x, y, t) \equiv Y(x, y, t, 0), \quad x = \text{const}. \tag{2}$$

It is pointed out that the systems in standard form $\dot{x} = \varepsilon X(x,t)$ and the systems with a quickly rotating phase investigated by N.N.Bogolyubov are exceptional cases of (1), and that the approximate equations of second order for these systems result from (4).

(1) is considered in $0 \leq \varepsilon \leq \varepsilon_0$; $x, y, t \in G$, G -- open region. At first 15 assumptions are given:

1) X,Y -- bounded, continuous, and have continuous uniformly bounded derivatives with respect to x,y,t and two first derivatives with respect to ε, where X''_{ε^2}, Y''_{ε^2} are uniformly bounded.

2) Through each point of G there goes a single integral curve (3) of (2) which for $t_0 \leq t < \infty$ lies in G, which for $t \leq t_0$ is continuable up to the boundary of G or up to $t > -\infty$. (3) is continuous, has continuous bounded

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derivatives of first and second order with respect to y_0, t_0.
$0 < c_1 \leq |\mathrm{Det}\ D| \leq c_2 < \infty$, where $D \equiv \partial\varphi/\partial y_0$ ($\partial\varphi/\partial y_0$ etc. denotes the matrix $\|\partial\varphi_i/\partial y_{0k}\|$, etc.).
3) in G there lies an (n+m)-dimensional manifold M: $x = a(\lambda)$, $y = b(\lambda)$, $t = c(\lambda)$ ($\lambda = \{\lambda_1, \ldots, \lambda_{n+m}\} \in \Lambda$, Λ -- open region), a,b,c are continuous, have continuous bounded derivatives; $\sum_{i=1}^{n+m+1} A_i^2 \geqslant \mathrm{const} > 0$, where A_i are minors of (n+m)-th order of $\|\partial a/\partial\lambda, \partial b/\partial\lambda, \partial c/\partial\lambda\|$.
The absolute values of the angles of intersection of (3) with M are bounded from below by a positive constant. Every curve (3) of G intersects M one time.
4) There exists a mean value $\overline{X}_1$ of X_1. The function $S \equiv X_1 - \overline{X}_1$ is uniformly bounded.
5) For $0 < \varepsilon \leq \varepsilon_0$ there exist open bounded $G_0(\varepsilon) \subseteq G$ which contain (x_0, y_0, t_0) together with a ϱ-neighborhood. The time which is needed by (3) from an arbitrary point of G_0 to M is $\leq K/\varepsilon$ (K = const > 0). For

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$0 < \varepsilon \leq \varepsilon_0$ there exist open $G_1(\varepsilon) \subset G_0$ containing x_0, y_0, t_0; the distances of the points of the G_1 from the boundary of G_0 are bounded from below by a positive constant.

Under the assumptions 1)-5) in G there exists a continuously differentiable solution u_1 of

$$\frac{\partial u_1}{\partial t} + \frac{\partial u_1}{\partial y} Y_0 = S, \quad u_1(x,y,t)\Big|_{x,y,t \in M} = 0.$$

6) Let u_1 be bounded in G and let it have continuous bounded derivatives with respect to x, y, t.

7) $\frac{\partial X_1}{\partial x} u_1$ has a mean value.

8) For $\partial u_1/\partial x$, $\partial u_1/\partial y$ there exist mean values.

9) $X_2 \equiv X'_\varepsilon\big|_{\varepsilon=0}$ has a mean value.

10) There exists the mean value $H(x)$ of the matrix D^{-1}, $0 < c_1 \leq |\mathrm{Det}\ H| \leq c_2 < \infty$.

11) There exists the mean value $R(x)$ of the function $D^{-1}(Y_1 + \frac{\partial Y_0}{\partial x} u_1)$

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$(Y_1 \equiv Y'_{\varepsilon}|_{\varepsilon=0})$.

12) There exists the mean value of $\frac{\partial X_1}{\partial y} D \int_{t_0}^{t} \left[D^{-1}\left(Y_1 + \frac{\partial Y_0}{\partial x} u_1 - B_1\right)\right]\Big|_{y=\rho(x,y_0,t_0,t)} dt$,

where $B_1(x) \equiv H^{-1}R$ (B_1 appears in (4)).

From 1)-12) there follows that in G a continuously differentiable solution of $\frac{\partial v_1}{\partial t} + \frac{\partial v_1}{\partial y} Y_0 - \frac{\partial Y_0}{\partial y} v_1 = Y_1 + \frac{\partial Y_0}{\partial x} u_1 - B_1$, $v_1\big|_{x,y,t \in M} = 0$ is defined where $\frac{\partial X_1}{\partial y} v_1$ has a mean value. $A_2(x)$ (in(4)) is the mean value of $P \equiv \frac{\partial X_1}{\partial x} + \frac{\partial X_1}{\partial y} v_1 - \frac{\partial u_1}{\partial x} \overline{X}_1 - \frac{\partial u_1}{\partial y} B_1 + X_2$.

13) $P - A_2$ is uniformly bounded.

14) The expressions

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$$\frac{\partial}{\partial y_0}\left(\int_{t_0}^{t_0+T}(P-A_2)\,dt\right),\quad \frac{\partial}{\partial t_0}\left(\int_{t_0}^{t_0+T}(P-A_2)\,dt\right),$$

$$\frac{\partial}{\partial y_0}\left(\int_{t_0}^{t_0+T}D^{-1}\left(Y_1+\frac{\partial Y_0}{\partial x}u_1-B_1\right)dt\right),\quad \frac{\partial}{\partial t_0}\left(\int_{t_0}^{t_0+T}D^{-1}\left(Y_1+\frac{\partial Y_0}{\partial x}u_1-B_1\right)dt\right)$$

are uniformly bounded for $0 \le T < \infty$ (the integrals are taken along (3)).

15) For every $K>0$ there exist $c_1>0$, $c_2>0$, $\bar{\varepsilon}>0$ ($\bar{\varepsilon} \le \varepsilon_0$) so that if on $[t_0, \bar{t}(\varepsilon)] \subseteq [t_0, K/\varepsilon]$ there exist the solutions of (4) and of $\dot{z} = Y_0(\bar{x}, z, t) + \varepsilon B_1(\bar{x}) + \varepsilon\varphi(t,\varepsilon)$ for $0 < \varepsilon \le \bar{\varepsilon}$, and the initial conditions x_0, y_0, t_0 and z_0, t_0 ($|z_0 - y_0| \le c_1$, x, y are solutions of (4) by x_0, y_0, t_0), and $\varphi(t,\varepsilon)$ is a continuous function so that $\sup_{t_0 \le t \le \bar{t}} |\varphi(t,\varepsilon)| \le c_1$ then for $0 < \varepsilon \le \bar{\varepsilon}$, $t \in [t_0, \bar{t}]$:

$$|\bar{y} - z| \le c_2\left(\varepsilon \sup_{t_0 \le t \le \bar{t}} |\varphi(t,\varepsilon)| \cdot |t - t_0| + |y_0 - z_0|\right).$$

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Higher approximation in averaging

Let $[t_o, t_1(\varepsilon)]$: $t_1 > t_o$, $t_1 - t_o \leq K/\varepsilon$, for $t \in [t_o, t_1]$ the solution of (4) with the initial point x_o, y_o, t_o does not leave $G_1(\varepsilon)$.

Theorem 1: Under the assumptions 1)-15) for arbitrary $K > 0$, $\delta > 0$ there exists an $\varepsilon_1 > 0$ ($\varepsilon_1 \leq \varepsilon_o$) so that for $0 \leq \varepsilon \leq \varepsilon_1$, $t \in [t_o, t_1(\varepsilon))$

1) $|y - \bar{y}| \leq \delta$ 2) $|x - \bar{x} - \varepsilon u_1(\bar{x}, \bar{y}, t)| \leq \varepsilon\delta$,

where x,y are solutions of (1) with the initial point x_o, y_o, t_o.

From 1)-15) it follows that in G there exists a continuously differentiable solution u_2 of $\frac{\partial u_2}{\partial t} + \frac{\partial u_2}{\partial y} Y_o = P - A_2$, $u_2(x,y,t)\big|_{x,y,t \in M} = 0$.

16) v_1, u_2 are bounded in G and have continuous bounded derivatives with respect to x,y,t.

17) The expressions

$$\int_{t_o}^{t_o+T} S\, dt, \quad \int_{t_o}^{t_o+T} (P - A_2)\, dt, \quad \int_{t_o}^{t_o+T} D^{-1}\left(Y_1 + \frac{\partial Y_o}{\partial x} u_1 - B_1'\right) dt$$

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(integrals along (3)) are uniformly bounded for $0 \leq T < \infty$.
Theorem 2: Under the assumptions 1)-17) for every $K > 0$ there exist $c > 0$, $\varepsilon_1 > 0$ ($\varepsilon_1 \leq \varepsilon_0$) so that for $0 < \varepsilon \leq \varepsilon_1$, $t \in [t_0, t_1(\varepsilon)]$:

1) $|y - \bar{y}| \leq C\varepsilon$ 2) $|x - \bar{\bar{x}} - \varepsilon u_1(\bar{x}, \bar{y}, t)| \leq C\varepsilon^2$.

There are 4 Soviet-bloc references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University im. M.V. Lomonosov)

PRESENTED: November 17, 1960, by I.G. Petrovskiy, Academician

SUBMITTED: November 16, 1960

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VOLOSOV, V.M.

"Differential Equations, which Contain a Small Parameter", UMN 5, Nr. 5, 14?-147 (1950).

VOLOSOV, V. M.

USSR/Mathematics - Differential Equations 11 Aug 50

"Problem of Differential Equations With Small Parameter in the Highest Derivative," V. M. Volosov

"Dok Ak Nauk SSSR" Vol LXXIII, No 5, pp 873-876

Subject eq is expressed thus: c·y([illegible] + f([illegible] y) = 0, where k is 1, 2, 3, ...(n-1) and c is small parameter. Problem [illegible] behavior of its soln y = F(x, c) as c approaches zero. In particular, Volosov considers cy'' + Q(x, y) = 0. Submitted 17 Jun 50 by Acad I. G. Petrovskiy.

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VOLOSOV, V. M.

USSR/Mathematics - Nonlinear Differential Equations Mar/Apr 52

"Nonlinear Differential Second-Order Equations With a Small Parameter in the Highest Derivative," V.M. Volosov, Moscow

"Matemat Sbor" Vol XXX (72), No 2, pp 245-270

Subject eq is of the form: $my'' + F(x,y,y') = 0$ ($m - 0$, a small pos parameter). The problem is to study the behavior of the soln as m becomes very small. A.N. Tikhonov proposed the problem to the author; namely, investigation of the conditions for which the soln of a nondegenerate eq oscillates stably around the soln of the

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degenerated eq as m tends to zero, and study of these oscillations. Submitted 4 Oct 51

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VOLOSOV, V. M.

PA 237T88

USSR/Mathematics - Nonlinearity Nov/Dec 52

"Theory of Nonlinear Differential Equations of Higher Orders With Small Parameter in the Highest Derivative," V. M. Volosov, Moscow

"Matemat Sbor" Vol 31 (73), No 3, pp 645-674

Considers the problem of the connection between the solution of ay(n) + Q(x,y,y',..,y(n-1)) = 0 (where a is a small parameter) and the solution of the degenerate eq Q = 0 for the case where the parameter a tends to 0. Particular cases have been considered by A.N. Tikhonov (1948-50), A. B. Vasil'yeva (1950-51), I. S. Gradshteyn (1949-51), and I. M. Volk (1946).

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VOLOSOV, V. M.

PA 237T89

USSR/Mathematics - Small Parameter Nov/Dec 52

"Solutions of Certain Differential Equations of Second Order Which Depend on a Parameter," V. M. Volosov, Moscow

"Matemat Sbor" Vol 31 (73), No 3, pp 675-686

Considers eqs of the form $a[y'' + f(x,y,y')] + F(x,y) = 0$, where $\underline{a}$ is a small parameter. Investigates the solution of this eq on a certain interval $[x_0, \bar{x}]$, with given initial conditions. Obtains results analogous to those of A. N. Tikhonov, A. B. Vasil'yeva, and I. S. Gradshteyn for eqs of the type $ay'' + Q(x,y) = 0$. States that A. N. Tikhonov proposed the problem of studying eqs with parameters.

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VOLOSOV, V. M.

Volosov, V. M. Quasihomogeneous differential equations of the second order having a small parameter. Mat Sb N.S. 36(78) (1955), 501–554. (Russian)

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Previous results of the author [Dokl. Akad Nauk SSSR (N.S.) 73 (1950), 873–876, Mat. Sb N.S. 30(72) (1952), 245–270, 31(73) (1952), 645–674, MR 12, 101, 14, 276, 1086] are here generalized to equations $\mu(\alpha y'' + \beta y' + \gamma) + Q(y, x) = 0$ $(\mu \to 0)$. Assume that the functions α, β, γ, Q are defined and continuous for $x_0 \leq x \leq \bar{x}$, $-\infty < y, y', y'' < +\infty$, Q has piecewise continuous second derivatives, satisfies [illegible] where f is defined and has a [illegible] second [illegible] in x_0, $\bar{x}$ [illegible]

$\alpha = \alpha(y'', y', y, x)$ satisfies $0 < C_1 \leq \alpha \leq C_2$, has limits $\alpha_i(y', y, x)$ $(i = 1, 2)$, corresponding to $y \leq f$, $y'' \to +\infty$ and $y \geq f$, $y'' \to -\infty$, $|\alpha - \alpha_i| \leq K|y''|^{-k}$, $k > 1$ [illegible] 2, α_i have limits $\alpha_i^0(y, x)$ when $|y'| \to \infty$, $|\alpha_i - \alpha_i^0| \leq K|y'|^{-l}$ $(l > 1)$, the α_i are continuous and the α_i^0 have piecewise continuous second derivatives, $\beta = \beta(y'', y', y, x)$ is bounded, has uniform limits $\beta^k(y', y, x)$ $(k = 1, 2)$ corresponding to $y' \to \mp\infty$, each one of the β^k has uniform limits $\beta_i^k(y, x)$ when $y'' \to \mp\infty$, $y \lessgtr f$, the β^k are con[illegible] and the β_i^k have piecewise continuous first derivatives [illegible] (y'', y', y, x)

satisfies $|\gamma| \leq \varphi(y)$, φ being any even function. Then, if $y(x, \mu)$ is the solution satisfying $y(x_0) = y_0$, $y'(x_0) = y_0'$, and if $y_0 = f(x_0)$, $y(x, \mu) \to f(x)$ uniformly when $\mu \to 0$; if $y_0 \neq f(x_0)$, $y(x, \mu)$ is bounded and oscillates around $y = f(x)$ with a frequency of the order of μ^{-1}, the maxima and minima approaching certain curves $y = F_k(x)$, $k = 1, 2$, which satisfy certain differential equations and whose initial values $F_k(x_0)$ depend on the value of $y_0 - f(x_0)$. If $\varphi(y'', y', y, x)$ is any bounded continuous function satisfying the same assumptions as β, the limit as $\mu \to 0$ of $\int_a^b \varphi(y'', y', y, x)\,dx$ $(x_0 \leq a < b \leq \bar{x})$, exists and may be explicitly calculated. Several examples show that most of the assumptions made are essential; if they are not satisfied $y(x, \mu)$ may diverge. The limit cases $k = \frac{1}{2}$ and $l = 1$ in the assumptions on α are also considered; in these cases, with a certain refinement of the assumptions, the main results still hold true.

J. L. Massera.

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SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/2 PG - 48
AUTHOR VOLOSOV V.M.
TITLE On certain systems of differential equations with a small parameter.
PERIODICAL Doklady Akad. Nauk 105, 397-400 (1955)
reviewed 7/1956

The author considers the system

$$
(1)\qquad
\begin{aligned}
\mu v' + Q(z, u_i, y_e, x) &= 0\\
z' &= \alpha(x) v + \psi(z, u_i, y_e, x)\\
u_i' &= \beta_i(x) v + \varphi_i(z, u_j, y_e, x)\\
y_e' &= \lambda_e(z, u_i, y_j, x)\ ,
\end{aligned}
$$

where μ is a small positive number. This system is a generalization of the system which arises from the equation

$$
(2)\qquad \mu y^{(n)} + Q(y^{(n-2)}, y^{(n-3)}, \ldots, y, x)
$$

by the substitution